Sample rows/columns of City location data provided by **Company X** is as below:

City	Lat	Lng	Country	Capital	Population
Tokyo	35.6897	139.6922	Japan	primary	37977000
Jakarta	-6.2146	106.8451	Indonesia	primary	34540000
Delhi	28.66	77.23	India	admin	29617000
Mumbai	18.9667	72.8333	India	admin	23355000
Manila	14.5958	120.9772	Philippines	primary	23088000
Shanghai	31.1667	121.4667	China	admin	22120000
São Paulo	-23.5504	-46.6339	Brazil	admin	22046000
Seoul	37.5833	127	Korea, South	primary	21794000
Mexico City	19.4333	-99.1333	Mexico	primary	20996000
Guangzhou	23.1288	113.259	China	admin	20902000
Beijing	39.905	116.3914	China	primary	19433000
Cairo	30.0561	31.2394	Egypt	primary	19372000
New York	40.6943	-73.9249	United States		18713220
Kolkāta	22.5411	88.3378	India	admin	17560000
Moscow	55.7558	37.6178	Russia	primary	17125000
……	……	……	……..	……	……..

Relevant column details:

Sl#	Column Title	Details
1	City	City name
2	Country	Country name
3	Lat	City latitude
4	Lng	City longitude
5	Capital	Whether primary/admin capital
6	Population	Current city population

To address the subject requirement, ***Foursquare location data service(FLDS)*** will be used. More specifically:

- **venues/categories** : Returns a hierarchical list of categories applied to venues.
- **venues/search**: Returns a list of venues near the current location, optionally matching a search term.

Above apis will be used. Using *venues/categories* api we will get all the venue category details used by FLDS. Each venue category also contains sub categories.

Using *venues/search* api along with target *city lat/lng* data and top level venue *categoryId*s we will fetch all target venues in the vicinity of any target city.

Important columns of *venues data-frame* are as below:

Sl#	Column Title	Details
1	Name	Venue name
2	Distance	Distance in m from city center
3	Lat	Venue latitude
4	Lng	Venue longitude
5	Postal-code	Postal code of venue
6	Address	Venue address

After that, applying ***k-means clustering*** algorithm on venue location data and varying cluster size we can get the suitable delivery depot latitude & longitude from the kmeans cluster centers.

Finally, to get the actual physical address of the proposed delivery depots given by ***k-means clustering*** we will use reverse Geo-coding service of *https://revgeocode.search.hereapi.com api.*

To plot the venues and proposed depot location we will use ***folium*** library.

City data : https://github.com/dasBikash84/Coursera_Capstone/blob/master/worldcities.csv

Notebook: https://github.com/dasBikash84/Coursera_Capstone/blob/master/courier_distribution_hub_calculator.ipynb

Sample city map with all venues: https://github.com/dasBikash84/Coursera_Capstone/blob/master/Toronto_only_venues.html

Sample city map with proposed depot locations: https://github.com/dasBikash84/Coursera_Capstone/blob/master/Toronto_venues_with_depots.html